

Blood studies carried out by Dr. Muriel Bell at the Otago Medical School indicated that the anæmia so commonly associated with lamb sickness at Morton Mains does not run parallel with the severity of sickness, which suggests that anæmia results from weakness of the animals and is secondary to faulty or poor nutrition.

Field experiments were undertaken to determine the relative value of cobalt licks and cobalt top-dressing of pasture as alternative methods of supplying cobalt to stock. The top-dressing experiments were remarkably successful and demonstrated that the application of very small quantities of cobalt incorporated in fertilizers affords a highly efficacious and practical method of raising to the optimum level the cobalt status of pasture which is deficient in this element. The success of these experiments marks a big step forward in the treatment and prevention of diseases of the bush-sickness type. An outstanding feature arising from the work has been the rapidity with which the results have been applied by farmers in many areas and the beneficial results obtained in practice. A prominent stock and station agent estimated that the use of cobalt will result in increased output to the value of £100,000 in one province alone.

It is interesting to note that four interesting cases of the beneficial effects of "trace" elements are under investigation in the Dominion at present—namely, cobalt and iodine in relation to stock and possibly human health; boron in relation to internal cork of apples and brown-heart of swedes and turnips; and zinc in relation to mottled leaf of citrus.

PHORMIUM TENAX.

An important development during the year in regard to New Zealand flax was the discussions leading to the formulation by the Bureau of Industry of a scheme for the rehabilitation of the flax industry, in the course of which the services of the Department have been largely drawn upon in connection with the research and technical problems involved. The visit in October of the Chairman of the Chairman of the Imperial Institute Advisory Committee on Vegetable Fibres was of great assistance in assessing the value of the work being done in New Zealand and the lines along which it should proceed.

A solid foundation for the production of flax fibre of proved and uniform quality and utility has already been laid as a result of the research work on flax-breeding sponsored by the Department. During the past year the area planted in special strains of flax has been increased from twenty-five to forty-seven acres, and all selected varieties are growing well. Yield trials of certain hybrids showed a 50-per-cent. increase in yield over best-selected plants, while the milling trials yielded fibre grading up to 98 points. Arrangements are now well in hand for large-scale multiplication on commercial areas. It is perhaps unfortunate that we do not yet know sufficiently well the relation between soil type or profile to suitability for permanent high yield of phormium with a minimum of yellow-leaf, but steps are being taken to collect information to this end.

With reference to the question of decortication, a thorough study has been made of the so-called explosion decortication method, while a stripper of new design has been constructed and will, it is hoped, be proceeded with after the inauguration of the organization under the Bureau of Industry. Other promising methods of decortication are under investigation by the Labour Department and by private interests. Considerable work has been carried out on the properties of pulp for fine papers produced from phormium. A chemist was also seconded to the woolpack factory at Foxton, and a valuable report on process control has been prepared and forwarded to the management.

MISCELLANEOUS.

Among the miscellaneous research investigations conducted with a view to promoting the development of new industries the following may be mentioned:—

Further experimental consignments of New Zealand asparagus were shipped to London in cold storage in order to test the practicability of developing an export trade to Great Britain. In conjunction with the main purpose of the experiments, which was to test the keeping-quality of the asparagus under cold-storage conditions during the requisite period and its after-storage life, the effects of different methods of wrapping and packing were examined. Arrangements were made, through the Department's Scientific Liaison Officer in London, to have the asparagus examined on arrival by officers of the Cambridge Low Temperature Research Station, assisted by Mr. L. W. Tiller. The bulk of the asparagus was also submitted for examination by Covent Garden merchants. The results of the experiments were, on the whole, most encouraging. The asparagus arrived in good condition and was considered to be suitable for the United Kingdom market. The only criticism of importance had reference to the overmature character of a considerable proportion of the heads and the necessity for stricter attention to grading for size. A number of points in connection with the effect of maturity on the storage life of asparagus and the optimum conditions for transport also await investigation, and it is proposed to give attention to these during the coming year, utilizing for this purpose the experimental cool store attached to the Dominion Laboratory.

A considerable amount of preliminary work has been carried out on materials likely to be useful in conjunction with cement to confer special properties on the various forms of concrete products. A pamphlet was published on the New Zealand resources of pozzolanic material, and the available supplies of diatomaceous earth have also been investigated. A fairly complete survey of our bentonite resources has been made, and experiments are now being undertaken in regard to its various avenues of utilization.

An increasing number of inquiries in relation to technical problems of industry have been dealt with during the year.

Overseas Contacts.—The Department's Scientific Liaison Officer, Mr. Nevill Wright, who is attached to the High Commissioner's Office in London, continues to perform valuable services in maintaining contact with research organizations in the United Kingdom; in representing the New Zealand Government on various scientific bodies; in making the necessary arrangements for the examination of experimental shipments of meat, fruit, and dairy produce; and in procuring information in connection with scientific matters in general.